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Table of Contents

FREEZING AND STORING MEAT FOR QUALITY AND ECONOMY

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Meat cannot be kept in edible condition for any length of time without some method of preservation such as salting, drying, smoking, canning, or freezing. Quick freezing and storage is the method that most nearly retains the original characteristics of meat until it is used, and for this reason commercial lockers and home freezers have gained public favor in recent years.

The practicability of artificial freezing of meat was discovered by accident about 1880 when a refrigerated shipment of meat from Australia to England became frozen enroute. Since that time many improvements have been made in the methods of refrigeration, and the popularity of freezing meat as a means of preserving it has increased. The first step in making this form of preservation readily available to individuals was the development of the frozen-food locker system which was inaugurated in 1908.

The more recent development of home freezers for the preservation and storage of meats, fruits, and vegetables in the home has gained ready acceptance. Approximately one and one-half million home freezers are being used in American homes today. This type of freezer preservation has been used in South Dakota for nearly a decade, and with the great expansion of REA facilities in this state many more families will be installing home freezers in their homes.

Along with the rapid increase in the use of home freezers, there has been a demand for additional knowledge regarding how to use them for maximum efficiency. One of the most common questions asked is, "What type of wrapping materials should I use when freezing and storing meat in home freezer units?" This is only one of the factors which affect the efficient use of home freezer units. Such items as cost of operation, type of wrapping materials used, rate and capacity of freezing, size and construction of unit, and the quality retained in the frozen product are a few of the most important. Their relative importance will depend largely upon the circumstances that exist in each home.

To answer some of these questions a study was made of the comparative efficiency of wrapping materials, home freezer units, and a commercial locker plant.

Review of Previous Work

Voluminous literature is available on the freezing and storage of beef and other meats in locker plants. In general, the published research results have shown that the quality of beef or other meat is not improved by freez-

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ing, but it can be maintained for relatively long periods of time if properly frozen and stored.

Dehydration and rancidity are the most common causes of low quality in stored, frozen meats, and fortunately both of these factors can be controlled. Maintaining a high relative humidity will reduce the degree of dehydration, and rancidity can be retarded greatly by keeping the meats from coming in contact with air. A good wrapping material will protect the product from evaporation and prevent the development of rancidity by excluding oxygen.

It has been found that 0 degrees F. or lower is the most desirable temperature for storing frozen beef, and under these conditions it can be stored satisfactorily for a period of 9 to 12 months. Some workers have reported storage periods of 12 to 15 months, but in later studies have reduced the recommended period to 8 to 12 months.

Drip or moisture loss of meat during thawing and cooking is definitely affected by freezing rate and length of time in storage. It has been shown that drip losses decrease as freezing temperatures are lowered from 18 to –114 degrees F.[2] and that an increase in the length of time between slaughtering and freezing also will decrease the amount of drip.

[2]This temperature can be obtained by use of liquid air or dry ice.

Material and Methods Used

Freezer Units

The home freezer units and the temperature measuring equipment used in this study are shown in Figure 1. The freezers were of the following types:

1. A deep-chest type with eight cubic feet of freezing and storage space. Freezing capacity per 24 hours, 50 lbs.; total capacity, 280 lbs.; steel outside covering; baked enamel finish; aluminum inside lining; outside dimensions, 48½ x 36 x 31 inches; fiber glass insulation of 4 inches on bottom, top, and all sides; hermetically sealed compressor of ¼ HP motor; refrigerant dryer; forced draft condenser; coils for evaporator; Freon-12 as refrigerant; thermometer; temperature control range 0 to -10°; net weight, 243 lbs.

2. An upright or vertical cabinet type of seven cubic feet capacity with

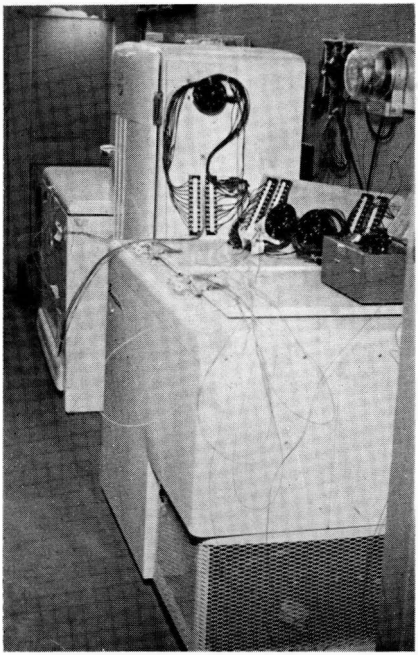

Fig. 1. Three home freezers used in this study

4 compartments; storage capacity, 250 lbs.; steel outside covering; baked enamel finish; steel inside lining; porcelain interior finish; outside dimensions, 31 x 62 x 28 inches; Balsam Wool insulation, of 4, 3¾, and 4¼ inches on sides, bottom, and doors respectively; hermetically sealed compressor; 1/6 HP motor; static condenser; metal plates for evaporator also serve as shelves; Freon-12 for refrigerant; control range 0 to –10; weight, 360 lbs.

3. A third type of freezer, with a small sharp-freeze compartment and a larger storage compartment, was used for some of the tests. It had a total capacity of eight cubic feet and was equipped with a ⅓ HP motor and a belted type compressor.

4. A commercial locker plant was tested for purposes of comparison. The same temperature measuring equipment was transported and used as was used in the other tests.

Temperature Measuring Equipment

The temperature measuring equipment is shown in Figure 2. It consisted of a potentiometer calibrated to read temperatures from copper-constantan thermo-couples. The thermo-couple wires were in woven glass insulation. The bare and twisted ends of the thermo-couples were placed at various locations in the freezer chests and in the meat packages to be tested. The wires were then led through the rubber seal strip at the freezer chest door and then to terminal blocks and 10-point rotary switches. The rotary switches permitted rapid changes of connections between thermo-couples in the chests and the potentiometer. As it was necessary at times to read

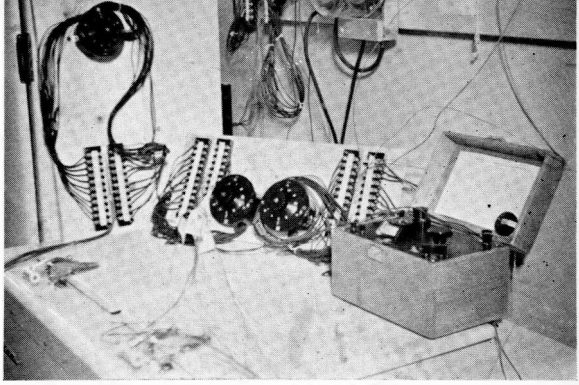

Fig. 2. Equipment used to measure the freezing rate of the different cuts of meat, and the variations of temperature within the freezers

and record 25 or more temperatures in a 20-minute period during the freezing trials, such rapid changes of connections were essential.

By placing thermo-couples in the lowest and highest chest positions, or against freezing plates it was possible to know the variations within the box. By placing a thermo-couple just under the wrap of a package and another in the center of the package it was possible to know the freezing rate of the package.

Each freezer chest was connected through a watt-hour meter so that the kilowatt-hours per hour or day could be known for each freezer.

To determine the rate of freezing of the different freezing units, temperature readings were made every 20 minutes during the freezing period until all packages of meat had reached a storage temperature of 0°F. Temperature readings also were taken intermittently during the storage period, of from 5 to 10 months, in order to determine any fluctuations in temperature that might have occurred during that time.

Wrapping Materials

Four different types of wrapping material were used in the study. These were: (1) A wax, locker paper, waxed

on one side only, (2) a petroleum wax known by the trade name of "No-Air Wrap," (3) a laminated aluminum foil, and (4) a laminated wax paper. All packages wrapped in paper and aluminum were wrapped in the standard confectioner's or drug-store style.

The "No-Air Wrap" was applied after the meat was frozen, by dipping the meat into the liquid wax which then hardened and formed a protective covering and seal around the frozen meat.

Meats

Four types of meat cuts, namely, beef roasts, loin steaks, round steaks, and ground beef, were used in the study. These were chosen because they represented as wide a variation in freezing rate and storage ability as any of the cuts of meat commonly frozen and stored in freezer lockers. The roasts weighed approximately three and one-half pounds, the loin steaks and round steaks were packaged to weigh about two and one-half pounds, and the ground beef, one and one-half pounds per package. This most nearly represented the size of package wrapped for home units and would be sufficient for a family of four people.

Defrosting and Cooking

After the meat had been in storage for the specified periods of time, it was taken from the freezer, the wrapping material was removed, and the cuts of meat were weighed to determine the loss in weight during freezing and storage. The meat was allowed to thaw at room temperature, the ground beef for a period of five hours, the other cuts for a 12-hour period.

Immediately after the thawing period, each package of ground beef was thoroughly mixed, and formed into five patties of equal weight and thickness. These were broiled for four minutes on each side at a distance of two inches from the heat unit. The five cooked patties were then weighed together to determine the loss during cooking. The standing rib roasts were roasted on a rack in a shallow pan with an oven temperature of 300° F. The pot roasts and round steaks were braised without previous searing. All roasts were cooked until the internal temperature of the meat reached 170° F. (well-done). Loin steaks were broiled eight minutes on each side on a rack placed three inches below the source of heat. Each roast and steak was weighed separately in determining losses during cooking. The general desirability of the meat was determined by a committee of tasters.

Results

Cost of Operation

The cost of operation of a freezer locker, in terms of Kwh consumption, must be studied in two periods, namely the freezing period and the storage period. When freezing loads of 10 pounds of meat were placed in the freezer, the freezing period was estimated at 12 hours, although completion of freezing often occurs in less time. The chest type freezer used 0.75 Kwh for a 12-hour storage period at one location, and at a warmer location .80 to 1.00 Kwh per 12 hours. How-

ever, for a 12-hour freezing plus storage period, current consumption was 2 Kwh's in the first location, and slightly over 2 Kwh's in the second. By adding two 12-hour storage periods for a normal 24-hour storage day, the Kwh consumption was 1.5 Kwh's to 2.0 Kwh's. By adding one freezing period and one storage period we have a normal "freezing load" day of 2.75 Kwh's to 3 Kwh's per day.

With the upright type of chest used there were higher current consumption figures. For a 12-hour storage period at the second location 1.3 Kwh's and for a 12-hour freezing period 1.7 Kwh's were consumed. This would make a storage day consumption 2.6 Kwh's and a normal freezing day consumption of 3.0 Kwh's.

To arrive at a power cost for this size of freezer the annual amount of frozen foods for a year was assumed at 800 pounds, with 80 "normal freezing days." The current consumption for these days would be 80 x 3 Kwh's, or 240 Kwh's, and for the remaining 285 days it would be 285 x (2 Kwh's to 2.6 Kwh's) or 570 Kwh's to 741 Kwh's. Annual power consumption then becomes 810 Kwh's to 981 Kwh's. With current costs at $0.03 per Kwh the annual power costs become $24.30 to $29.43.

The major additional costs of the home freezer are those of depreciation, interest, and repairs which can be estimated as $30 per year for this size of freezer. This added to the power costs makes a total annual cost of $54.30 to $59.43. It should be noted here that no charges or costs have been figured on the processing which would include such items as wrapping material and cutting expense. These costs might be estimated at $10.00 per year if no charge is allowed for labor involved in cutting and wrapping.

If the same freezing load were to be put through a locker plant the cost would be approximately as follows:

Rental for two lockers $24.00
Cutting, wrapping, and freezing at 2c per lb. $16.00

To this should be added a figure for travel, although this is hard to estimate. It might be estimated at $10 to $20 per year but under some circumstances might not involve any extra trips just for locker packages.

The costs of the two methods do not differ greatly and the cost of either is not a burden to the average farm family.

The preceding data show only small differences in the operational expenses of the two different methods of freezing and storage. It does not include such items as cost of paper and supplies necessary for home processing, and neither does it allow for any insurance whereby compensation or replacement may be obtained in case of spoilage or loss of meat or other food products. This factor assumes quite a great importance when inexperienced personnel are doing the processing.

Rate of freezing

Quick freezing or sharp freezing is one of the primary concerns in the freezer-locker business. Without this process, freezing would spoil more food than it would preserve. Therefore, it is important that owners be familiar with the powers and limitations of their home freezer units, because these factors will have the most effect on the efficiency of the unit as

Table 1. Drop in Degrees F. per Minute per Individual Package of Meat as Affected by Different Freezing Units

Type of meat	Type of unit			
	Commercial locker	Deep chest	Upright cabinet	Deep chest combination
Beef roasts	.064	.073	.088	.096
Round steak	.075	.087	.113	.119
Loin steak	.079	.090	.101	.128
Ground beef	.094	.097	.094	.116
All meats	**.078**	**.087**	**.099**	**.115**

far as food preservation and storage are concerned. For this reason the freezing rates of the different units were compared.

The initial freezing rate test was made with 40 pounds of meat in each of the freezer units. This amount was equal to five pounds of meat per cubic foot of freezing capacity and required nearly 12 hours for freezing. Two subsequent tests of freezing rates were made with similar amounts of meat but at the same time that other meat and vegetables were in storage in the freezer units. Table 1 is a tabulation of the average freezing rates of the various units obtained from a series of three separate freezing tests.

Observation of the data presented in Table 1 will clearly show that all home units studied had a faster freezing rate than the commercial locker. The deep chest unit with the separate freezing compartment froze nearly 50 percent faster than the commercial locker and was responsible for the significant difference in the rate of freezing when the data were analyzed statistically. The average temperature of the sharp or quick freezing compartment of the commercial locker was a –10 degrees F., whereas the temperature of the home units decreased gradually to reach a low approximately –12 degrees F. for all units in freezing all meats to a storage temperature of 0 degrees F. It may also be noted from Table 1 that the different cuts of meat affected the freezing rate. In general, it required more time to freeze the beef roasts than any of the other meats frozen. This fact is to be expected because of the larger size of the roasts as compared to the other meats.

In addition to the type of freezer unit, the freezing rate also was affected by the type of wrapping material used. Table 2 shows the effects of the four different wrapping materials used in this study.

Table 2. Effect of Wrapping Materials on Freezing Rate of Meats Expressed as Drop in Degrees F. per Minute per Package

Type of meat	Type of wrap			
	No-Air wrap	Wax paper	Laminated aluminum foil	Laminated wax paper
Beef roasts	.121	.067	.072	.069
Round steak	.149	.082	.081	.082
Loin steak	.146	.081	.090	.081
Ground beef	.132	.088	.095	.086
All meats	**.137**	**.080**	**.086**	**.080**

It may be observed from Table 2 that the "No-Air Wrapped" meats froze faster than any of the others. This was expected because there is no covering on the meat during the freezing period when using this method of wrapping. The meat is dipped in the petroleum wax after it has been frozen, and the wax forms a protective covering and seal around the frozen meat.

Further observation of the above table reveals only slight differences in the effect of the other wrapping materials on the rate of freezing. This would indicate that differences in freezing rate of the meats were influenced more by the size of the package and the type of freezing unit than by any of the paper wrapping materials.

Loss in Weight

Loss in weight of the different cuts of meat during the freezing and storage period was considered a quality-contributing factor because it would affect the juiciness and palatability of the meat. This loss is affected by both freezers and wrapping materials. To determine the efficiency of the different wrapping materials and freezers, a study was made of the losses in the different freezers and losses with the different wrapping materials. The results of this study are shown in Tables 3 and 4.

Observation of the data presented in Table 3 will show that the meats frozen and stored in the commercial locker lost less weight than similar cuts of meat frozen and stored in the home freezer units. There are perhaps many factors that would contribute to this condition, but the most likely is the fact that the relative humidity was always higher in the commercial locker than it was in the home freezers. This higher relative humidity retarded the rate of moisture evaporation and held the losses in weight to a minimum during freezing and storage.

Table 4 clearly shows that meats

Table 3. Loss in Weight of Meats During Freezing and Storing as Affected by Type of Freezing Unit

Type of meat	Type of unit			
	Commercial locker	Deep chest	Upright cabinet	Deep chest combination
	%	%	%	%
Beef roasts	1.5	1.9	2.1	2.4
Round steak	1.1	4.0	3.1	4.8
Loin steak	2.2	2.9	2.8	2.8
Ground beef	1.7	2.0	2.7	2.4
All meats	**1.6**	**2.7**	**2.7**	**3.1**

Table 4. Loss in Weight of Meats During Freezing and Storing as Affected by Wrapping Materials

Type of meat	Type of wrap			
	No-Air wrap	Wax paper	Laminated aluminum foil	Laminated wax paper
	%	%	%	%
Beef roasts	1.4	5.1	.40	1.1
Round steak	3.0	6.9	1.3	2.6
Loin steak	2.6	5.7	.80	1.6
Ground beef	2.2	4.9	.50	1.2
All meats	**2.3**	**5.6**	**.80**	**1.6**

wrapped in wax locker paper had an extremely large loss in weight during the freezing and storage period. This fact was later reflected in the quality of the meat which was greatly dehydrated and freezer-burned. The laminated aluminum foil showed an unusual ability to control weight losses during freezing and storage and was excellent in its ability to preserve the quality of the meat.

Cooking Losses

Cooking losses are one of the most important factors affecting the quality of meats; they not only affect the palatability and desirability of the prepared meat, but they also affect the amount of meat that will be available for serving. Data comparing the effects of different home freezers and various wrapping materials on cooking losses are shown in Tables 5 and 6.

As may be noted in Table 5, there were only slight variations in the cooking losses resulting from freezing and storage in the different freezing units.

It will be noted from Table 6 that the laminated aluminum foil had the largest percentage loss in weight during cooking by 0.9 of a percent. This fact would appear to be the result of its small percentage weight loss during freezing and storage as shown in Table 4.

Table 5. Loss in Weight During Cooking as Affected by Type of Freezing Unit

Type of meat	Type of unit			
	Commercial locker	Deep chest	Upright cabinet	Deep chest combination
	%	%	%	%
Beef roasts	23.6	24.6	23.7	26.5
Round steak	31.0	30.4	30.8	27.7
Loin steak	31.1	24.4	24.4	22.1
Ground beef	29.1	28.2	25.8	28.0
All meats	**28.7**	**26.9**	**26.2**	**26.1**

Table 6. Loss in Weight During Cooking as Affected by Type of Wrapping Material Used

Type of meat	Type of wrap			
	No-Air wrap	Wax paper	Laminated aluminum foil	Laminated wax paper
	%	%	%	%
Beef roasts	21.4	22.8	26.3	28.0
Round steak	28.7	29.1	31.9	30.2
Loin steak	23.8	27.1	27.5	23.6
Ground beef	27.1	26.8	28.1	29.1
All meats	**25.2**	**26.6**	**28.6**	**27.7**

Discussion

Some of the factors affecting the efficient use of home freezer units have been discussed briefly. There are still others which need mentioning. The length of time different kinds of meat will keep under storage conditions, and the need for accuracy in dating and labeling of the packages must be understood. Research has shown that length of storage has a direct relationship on the quality of frozen meats. Therefore, it is important that their recommended storage periods be observed in order to insure the retention of high quality. In this connection, the dating and labeling is important. It not only tells what kind and how much meat is in a package, but the date serves as a reminder to use the meat before it overruns its recommended storage time.

There are many different recommendations for the storage length of meats and meat products, and all are satisfactory under certain conditions. The important factor to remember is that only meat of good quality should be stored for extended periods of time. The following limitations are recommended for the satisfactory storage of meats in home freezers.

1. It is not desirable to store beef or beef products for periods longer than one year. Beef and beef products stored for a year's time must be securely and tightly wrapped with a high grade wrapping material in order to retain satisfactory quality.

2. Fresh pork and pork products should not be stored longer than six months, and even shorter periods are to be preferred. The pork fat will become rancid even when frozen and cause undesirable flavors to develop.

3. Processed meat and meat products such as cured ham, bacon, and lard do not lend themselves to longer periods of storage than fresh pork products. These meats will retain their quality and desirability just as well under normal refrigeration as they will in freezer storage. The only objection to preservation by refrigeration is the growth of molds that necessitate extensive trimming before preparation.

It is easy to conclude from the above recommendations that "food turnover" is important. The efficiency of any storage operation depends upon the availability of space to accommodate products purchased at a saving for later disposition or consumption. With this fact in mind, it is easily understood why it is important to use stored frozen foods. Otherwise, quality is lost and valuable space occupied in the home freezer which prevents the storage of other food products which may be purchased at opportune times.

Careful consideration should be given to the size and construction of a home freezer unit. This is necessary to insure the complete satisfaction which should come to the owner who wants the adequate space, efficiency of operation, and the convenience which only the correctly chosen unit can supply. Beauty is quite often a factor in selling a product, but it does not necessarily indicate a more efficient unit.

Each of the two common types of home freezers has its advantages and disadvantages. The deep chest type has the advantage of its physical de-

sign to retain its coldness, in that heat enters with greater difficulty when the door is opened. In contrast, the opened door of the vertical type literally "pours" cold air from the bottom, which is replaced by the warmer air near the top of the cabinet. It was found in this study that freezers of the deep chest type required less time to reach sharp freezing temperatures. This fact was attributed to the greater cold-retaining ability of the deep chest type during the loading period.

Freezing rates and capacity affect the efficiency of home freezer units. In this respect it is difficult to compare the home unit with the commercial locker. The capacity of the commercial locker for freezing and storage is limited only by the size of the plant that the owner wants to construct. Such is not true in the case of the home units which have quite definite limits on their freezing capacity. Sharp or quick freezing of meat requires that its internal temperature be reduced to 0 degrees F. in a period of 12 hours or less. The optimum loading of a home freezer is, therefore, limited to four pounds of meat for each cubic foot of capacity during any one 24-hour period in order to lower efficiently the temperature of meat to 0 degrees F.

It was found in this study that loading five pounds of meat per cubic foot of freezing capacity increased the time required for freezing to nearly 12 hours. This length of time was so near the upper limit for gaining the advantages of sharp or quick freezing that it is doubtful if they could be obtained under all conditions. However, the commercial locker was able to take all the packages of meat that the sharp freezing room would accommodate and still be able to reduce the internal temperature of all packages to 0 degrees F. in a 12-hour period.

It was found in this study that the type of wrapping material used had a greater effect on weight loss during the freezing and storage period than did the type of freezer. The weight losses due to wrapping materials varied from .8 to 5.6 percent, whereas weight losses of only 1.8 to 3.1 percent occurred as a result of the different types of freezers. A practical example of storing 100 pounds of meat in each of two different wrapping materials would portray more clearly the importance of the above weight losses. After a storage period of 10 months in the same freezer there would be nearly five pounds more meat remaining in the packages wrapped with a laminated aluminum foil material than in the packages wrapped with a wax paper.

Only slight differences in the cooking losses of the different cuts of meat could be attributed to the freezer units, though noticeable differences occurred in the quality of the cooked meats. This fact was attributed to the type of wrapping material used, in that the meat wrapped in the wax paper was definitely inferior to the meats wrapped in any of the other materials. The loss of quality was attributed to the large loss in weight due to evaporation and consequent dehydration of the meat which occurred during the storage period. This fact indicates that losses which occur during storage have a greater effect on the quality of the cooked meat than do those which occur during cooking. Therefore, it is important to remem-

ber that losses in weight during storage cannot be recovered by any method and usually will have a direct effect on the quality of the meat. With this fact in mind, it would seem advisable to keep the more serious losses which occur during storage at a minimum by using only high-grade wrapping materials which have the ability to prevent evaporation and dehydration under storage conditions.

Summary and Conclusions

In summarizing there are certain factors, as shown in this study, which should be remembered as ones affecting the efficiency of home freezer units.

Comparison of Costs

In comparing the costs of the home freezer versus locker plant methods of freezing and storing meat, such items as initial installation, operation and upkeep, and convenience must be taken into consideration. All of these costs are individual in nature and will vary widely in different localities. To arrive at a power cost for the size of freezers studied, the annual amount of frozen foods for a year was assumed at 800 pounds, with 80 "normal freezing days." When calculated on the above basis, power consumption ranged from 810 to 981 Kwh (kilowatt-hours) per year. With current costs of $0.03 per Kwh, the annual power costs become $24.30 to $29.43.

The major additional costs of the home freezer are depreciation, interest, and repairs which can be estimated at $30 per year for this size of freezer. This amount added to the power cost makes a total annual cost of $54.30 to $59.43.

If the same freezing load were to be put through a locker plant, the cost would be approximately as follows: Rental for two lockers $24.00, processing at two cents per pound, $16.00. Added to these costs should be an amount for travel and convenience. This amount is hard to estimate, but under most circumstances might range from $10 to $20 per year.

The costs of the two methods do not differ greatly and the cost of either is not a burden to the average farm family.

Comparison of Wrapping Materials

The type and quality of the wrapping materials used will greatly affect the efficiency of any freezing unit. Four wrapping materials—"No-Air Wrap," wax paper, laminated aluminum foil, and laminated wax paper were tested in order to determine their effect on freezing rate; percentage weight losses during freezing, storage, and cooking; and on the quality retention of meats.

a. The above wrapping materials varied from .080 degrees to .137 degrees drop per minute in their effect on the freezing rate of the meats wrapped. The wax paper and the laminated wax paper were equally slow with a freezing rate of .080 degrees drop per minute, whereas the "No-Air Wrap" had a freezing rate of .137 degrees drop per minute.

b. A comparison of the percentage weight loss during the freezing and storage period showed that the laminated aluminum foil far excelled the

other wrapping materials. This material held the weight loss to .8 percent as compared to the wax paper which allowed a loss of 5.6 percent. The laminated wax paper and the "No-Air Wrap" were second and third respectively in controlling weight loss with losses of 1.6 and 2.3 percent.

c. Percentage weight loss during cooking, as affected by wrapping materials during storage, varied from 25.2 to 28.6 percent with the "No-Air Wrap" losing the least and the laminated aluminum foil the most. These differences were not significant and it may be concluded from this fact that wrapping materials have little if any effect on the cooking losses of meats.

All the data obtained from this study indicate that the home freezer is an efficient means of freezing and storing small quantities of meats. However, the efficiency of the home freezer for freezing and quality preservation is greatly impaired if large quantities are attempted or poor quality wrapping material is used. This fact should always be remembered and used as a guide in using the home freezer. Therefore, it would seem advisable to utilize the experience and capacity afforded by the commercial locker operator in those instances where a large quantity of meat is to be processed. By utilizing the facilities of the commercial locker, the home freezer would serve as an excellent storage unit for the processed meats and could also be used very satisfactorily for freezing the small quantities of meat that may be processed in the home. This system of operation would enhance the efficiency of the home freezer by permitting the owner to take advantage of the lower processing costs of the commercial locker plant, and also improve the quality of his meals by having a greater variety of fresh meats at home.